Keyser (P. D.)

ON SOME FORMS

OF

# INFLAMMATORY DISEASES OF THE EYE

BEING CAUSED BY DEFECTS IN

# REFRACTION AND ACCOMMODATION.

BY

P. D. KEYSER, M.D.,

SURGEON TO THE WILLS OPHTHALMIC HOSPITAL, PHILADELPHIA, ETC. ETC.

EXTRACTED FROM THE TRANSACTIONS OF THE MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA FOR 1877.



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# ON SOME FORMS OF INFLAMMATORY DISEASES OF THE EYE BEING CAUSED BY DEFECTS IN REFRACTION AND ACCOMMODATION.

A DISEASE can only be cured by removing the cause thereof. The symptoms of the disease are only the points which lead us to search from whence the trouble arises, so that the origin of the inflammation, pain, etc., can be eradicated.

With this fact in view, I have the past few years been looking carefully into the causes of the different forms of inflammatory troubles of the eyelids and conjunctiva, that present themselves to us, often with more or less of a history of recurrent congestion, and sometimes strain in the eye. In this way I have examined cases of the simple, follicular, and granular forms of conjunctivitis, as well as the phlyctenular form when occurring in subjects over ten years of age, particularly when the eyes of such young persons are used in study, close reading, or work; also the inflammations of the eyelids, as "blepharitis ciliaris, marginalis, etc.; and, in pterygium, which began to form in early years." The results of my examinations have been astonishing, as well as interesting, and to my mind clearly point out the origin of many such cases that have often given trouble for years, to be *ametropia*.

As a hyperæmia of the conjunctiva has been noticed in some cases after use of the eyes at steady objects, and in strong light, it has been lately suggested, that this condition might arise from some anomaly in the refractive state of the eye; and in cases of tedious forms of conjunctivitis in young persons the eyes have on examination been found to be imperfect, and after more careful and minute investigation, it has become an established fact, that any defect of refraction, let it be hypermetropia, myopia, or astigmatism, causes a strain upon the eye in acts of vision, which creates a congested or hyperæmic condition in the contiguous parts; and which if not properly relieved, creates inflammatory action, and morbid changes in

those parts. But if the eyes are rested from work for a time, the affected parts often resume their healthy action and appearance, only to return again to their diseased condition on the resumption of active work. And so on changing from better to worse, until a serious and chronic inflammation is established, that gives not only great annoyance and suffering, but also may endanger the vision to serious injury, if not permanent loss.

Some three years ago, my attention was attracted to this inflam matory condition from eye strain in a case of blepharitis; and since then, I have examined the acuity of vision of every case that presents to me a doubtful character in relation to its cause, and especially if of a recurrent type. My surprise has been great to see the defects of refraction that have been found, and the rapid and permanent success in the treatment, after the defect had been corrected.

In illustration of these remarks, I present some notes of cases from my private case-book for the past seventeen months.

In making the examinations, the accommodation was paralyzed in all the cases, so that a perfect and complete result could be obtained.

### *Inflammations of the Conjunctiva.*

#### Simple, Follicular, and Granular Conjunctivitis.

*March* 24, 1876. R. D. K., æt. 21. After using his eyes rather severely at close work two years, they became inflamed; and have been getting worse ever since, until they now present a well-marked case of follicular conjunctivitis. He has been treated at several of the eye clinics in this city, without any permanent benefit. Upon his coming to me for treatment, I immediately examined his vision, with the following result:—

R. E. Vn. $\frac{20}{\text{XX}}$[1]; atropinized $\frac{20}{\text{LXX}}$; with $+60\bigcirc +48_{c}90^{\circ} = \frac{20}{\text{XX}}$.

L. E. Vn. $\frac{20}{\text{XX}}$; atropinized $\frac{20}{\text{LXX}}$; with $+60\bigcirc +48_{c}90^{\circ} = \frac{20}{\text{XX}}$.

After the correction of his compound hypermetropic astigmatism, the eyes soon recovered under a simple treatment with weak astrin-

[1] It must be understood that in the examination of the acuity of vision, we have sets of letters or figures, and radiating lines on a circle, that are calculated for normal vision at certain distances. Thus $\frac{20}{\text{XX}}$ is normal vision $= \frac{1}{1}$; $\frac{20}{\text{XL}}$ is $= \frac{1}{2}$ vision; $\frac{20}{\text{LXX}} = \frac{2}{7}$ths and $\frac{20}{\text{C}} = \frac{1}{5}$th of normal vision, and so on. The numerator of the fraction represents the distance that the denominator (the letters) is seen. In normal acuity of vision each denominator should be seen at the distance it represents in value; as, for example, XX at 20 feet; XL at 40 feet; LXX at 70 feet, and C at 100 feet, etc.

gents, and he has since passed through a commercial college, studying day and night, without any return of his old malady.

*April* 1, 1876. Mr. G. F., æt. 25. Papillary granulations of the conjunctiva for some time. Lids glued after sleep. Eyes are much worse after long-continued work.

Vn. either eye $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+36 = \frac{20}{XX}$.

*May* 8, 1876. Master A. D., æt. 16. Mathematical instrument maker the past year. During most all the time has had conjunctivitis.

Vn. either eye $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+48 = \frac{20}{XX}$.

*June* 16, 1876. Miss S., æt. 23. Conjunctivitis the past year.

R. E. Vn. $\frac{20}{XXX}$; atropinized $\frac{20}{XXX}$; with $-60_{c}\,90° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XXX}$; atropinized $\frac{20}{XXX}$; with $-60_{c}\,90° = \frac{20}{XX}$.

*July*, 3, 1876. Mr. T., æt. 34. Papillary granulations for a long time.

R. E. Vn. $\frac{20}{XL}$; atropinized $\frac{20}{LXX}$; with $+9 = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XL}$; atropinized $\frac{20}{LXX}$; with $+9 = \frac{20}{XX}$.

*July* 8, 1876. Mr. L. A. G., æt. 17. Student. Follicular conjunctivitis the past two years. No relief from treatment.

Vn. either eye $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+36 = \frac{20}{XX}$.

*July* 27, 1876. Mrs. G. W., æt. 27. For the past six months has had conjunctivitis, without relief from the ordinary treatment.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{LXX}$; with $+36 \bigcirc +48_{c}\,90° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{LXX}$; with $+36 \bigcirc +48_{c}\,90° = \frac{20}{XX}$.

*October* 20, 1876. Miss A. H., æt. 12. Conjunctivitis for over two years.

R. E. Vn. $\frac{20}{XL}$; atropinized $\frac{10}{LXX}$; with $+20 \bigcirc +48_{c}\,90° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{L}$; atropinized $\frac{10}{C}$; with $+18 \bigcirc +36_{c}\,90° = \frac{20}{XX}$.

*October* 24, 1876. Mrs. S. M., æt. 23. Conjunctivitis the past three years.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+40 = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XXX}$; atropinized $\frac{20}{LXX}$; with $+12 = \frac{20}{XX}$.

*October* 30, 1876. Miss M. C., æt. 22. Seamstress. Conjunctivitis the past four years.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$ (?)[1]; with $+48_{c}\,90° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$ (?); with $+48_{c}\,90° = \frac{20}{XX}$

*November* 3, 1876. Mr. J. B. M., æt 27. Conjunctivitis.

Vn. either eye $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+30 = \frac{20}{XX}$.

*November* 9, 1876. Mr. E. S. J., æt. 34. Conjunctivitis.

Vn. either eye $\frac{20}{XX}$; atropinized $\frac{20}{0}$; with $+12 = \frac{20}{XX}$.

*January* 18, 1877. Mr. E. H., æt. 22. Student of theology. Complains that for the past year his eyes have been inflamed. They are worse when studying. Stat. præs.: Small papillary granulations on the conjunctiva.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+60_{c}\,90° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+60_{c}\,90° = \frac{20}{XX}$.

*January* 25, 1877. Mrs. S., æt. 35. Granular conjunctivitis for years.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+48 \bigcirc +48_{c}\,90° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+48 \bigcirc +48_{c}\,90° = \frac{20}{XX}$.

*Feb.* 5, 1877. Mr. J. W., æt. 24. Granular lids the past two years.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+48 \bigcirc +48_{c}\,75° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+48 \bigcirc +60_{c}\,100 = \frac{20}{XX}$.

*March* 15, 1877. Miss F., æt. 22. Chronic conjunctivis.

R. E. Vn. $\frac{20}{XL}$; atropinized $\frac{20}{XX}$; with $-60_{c}\,180° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XL}$; atropinized $\frac{20}{XL}$; with $(-60_{c}\,60° \bigcirc -42_{c}\,180°) = \frac{20}{XX}$.

[1] (?) indicates a little less.

*April* 5, 1877. F. A. R., æt. 17. Conjunctivitis the past five years.

R. E. Vn. $\frac{20}{XL}$; atropinized $\frac{20}{C}$; with $+9 \bigcirc +24_{c}180° = \frac{20}{XXX}$.

L. E. Vn. $\frac{20}{C}$; atropinized $\frac{3}{C}$; with $+4\frac{1}{2} = \frac{20}{XXX}$.

*April* 6, 1877. Mr. J. C., æt. 24. For over a year the eyes have been inflamed. Eyes become blood-shot after reading and any close work. The conjunctiva swollen, soft, and velvety.

Vn. either eye $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+30 = \frac{20}{XX}$.

*April* 17, 1877. Miss L. M., æt. 23. For years has suffered from conjunctivitis. Three years ago noticed that she was near-sighted, and got a pair of concave glasses from an optician, which somewhat relieved her.

R. E. Vn. $\frac{8}{C}$; with $-20 \bigcirc -48_{c}180° = \frac{20}{XX}$.

L. E. Vn. $\frac{5}{C}$; with $-9 \bigcirc -48_{c}180° = \frac{20}{XX}$.

*April* 21, 1877. Miss H., æt. 17. Conjunctivitis for some time.

L. E. Vn. $\frac{20}{XXX}$; atropinized $\frac{20}{XL}$; with $-48 = \frac{20}{XX}$.

R. E. Vn. $\frac{20}{LXX}$; atropinized $\frac{10}{C}$; with $-16 \bigcirc -60_{c}180° = \frac{20}{XX}$.

*April* 27, 1877. Mrs. J. M., æt. 32. Has always had trouble with her eyes when reading. Has had conjunctivitis for a long time.

R. E. Vn. $\frac{20}{LXX}$; atropinized $\frac{20}{C}$; with $(+16_{c}100° \bigcirc -48_{c}180°) = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{LXX}$; atropinized $\frac{20}{C}$; with $(+14_{c}100° \bigcirc -48_{c}180°) = \frac{20}{XX}$.

*May* 6, 1877. Mr. W. C., æt. 24. For two or three years, has had a slight conjunctivitis. The lids have been glued in the morning after sleep.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{LXX}$; with $+42 = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+48 = \frac{20}{XX}$.

*May* 12, 1877. Mr. A. P., æt. 20. Follicular conjunctivitis for five years.

R. E. Vn. $\frac{20}{LXX}$; atropinized $\frac{20}{XL}$; with $-42_{c}90° = \frac{20}{XXX}$.

L. E. Vn. $\frac{20}{LXX}$; atropinized $\frac{20}{XL}$; with $-42_{c}90° = \frac{20}{XXX}$.

*May* 22, 1877. Mr. P. H., æt. 27. Conjunctivitis for a long time.

R. E. Vn. $\frac{20}{\text{LXX}}$; atropinized $\frac{10}{\text{C}}$; with $+24 \bigcirc + 15_{\circ} 90° = \frac{20}{\text{XX}}$.

L. E. Vn. $\frac{20}{\text{XXX}}$; atropinized $\frac{20}{\text{LXX}}$; with $+24 = \frac{20}{\text{XX}}$.

*May* 25, 1877. Mr. D. F. S., æt. 24; student. Papillary granulations the past four years.

Vn. either eye $\frac{20}{\text{XX}}$; atropinized $\frac{20}{\text{XXX}}$; with $+40 = \frac{20}{\text{XX}}$.

*Phlyctenular Ophthalmia.*

*June* 19, 1876. Mary G., æt. 10. Conjunctivitis phlyctenular recurrent.

Vn. either eye $\frac{20}{\text{XX}}$; atropinized $\frac{20}{\text{XL}}$; with $+36 = \frac{20}{\text{XX}}$.

*July* 14, 1876. Mary R., æt. 9. Three or four attacks of phlyctenular conjunctivitis.

Vn. either eye $\frac{20}{\text{XX}}$; atropinized $\frac{20}{\text{XXX}}$; with $+48 = \frac{20}{\text{XX}}$.

*November* 10, 1876. Miss McG., æt. 21. Phlyctenular conjunctivitis off and on since childhood. Never could use her eyes long without bringing on the inflammation.

R. E. Vn. $\frac{20}{\text{XXX}}$; atropinized $\frac{20}{\text{C}}$; with $+11 = \frac{20}{\text{XX}}$.

L. E. Vn. $\frac{20}{\text{XXX}}$; atropinized $\frac{20}{\text{C}}$; with $+9 = \frac{20}{\text{XX}}$.

*March* 10, 1877. Master L., æt. 10. Phlyctenulæ on limbus conjunctivalis.

Vn. either eye $\frac{20}{\text{XX}}$; atropinized $\frac{20}{\text{XL}}$; with $+36 = \frac{20}{\text{XX}}$.

*April* 8, 1877. Mr. W. M., æt. 34. Conjunctivitis phlyctenular.

Vn. either eye $\frac{20}{\text{XL}}$; atropinized $\frac{20}{\text{C}}$; with $+30 = \frac{20}{\text{XXX}}$.

*May* 5, 1877. Master H. K., æt. 14. Phlyctenular conjunctivitis and keratitis off and on since two years old.

Vn. either eye $\frac{20}{\text{XX}}$; atropinized $\frac{20}{\text{LXX}}$; with $+24 = \frac{20}{\text{XX}}$.

*May* 21, 1877. E. A., æt. 9. Phlyctenular conjunctivitis.

Vn. either eye $\frac{20}{\text{XX}}$; atropinized $\frac{20}{\text{XL}}$; with $+36 = \frac{20}{\text{XX}}$.

*Pterygium.*

*January* 4, 1876. L. P., æt. 26. Pterygium R. E. (inward). On L. E. a collection of enlarged vessels, but no developed pterygium. The R. E. has been affected for many years; he thinks since his fourteenth or fifteenth year.

R. E. Vn. $\frac{20}{XX}$ (?); atropinized $\frac{20}{LXX}$; with $+36 \bigcirc +48_{c}\,75^{\circ} = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+36 = \frac{20}{XX}$.

*January* 15, 1876. J. F., æt. 30. Pterygium L. E. (inward). He reports that it has been growing for some years.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{LXX}$; with $+36 = \frac{20}{XX}$.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+60 = \frac{20}{XX}$.

*August* 14, 1876. F. M., æt. 14. Incipient pterygium both eyes (inward). Has only noticed them a short time.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{C}$; with $+24 \bigcirc +60_{c}\,90^{\circ} = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{C}$; with $+24 \bigcirc +60_{c}\,90^{\circ} = \frac{20}{XX}$.

*September* 27, 1876. E. P., æt. 35. Inward pterygium both eyes; coming the past ten or fifteen years.

R. E. Vn. $\frac{20}{XXX}$; atropinized $\frac{20}{C}$; with $+36 \bigcirc +30_{c}\,90^{\circ} = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XXX}$; atropinized $\frac{20}{C}$; with $+36 \bigcirc +30_{c}\,105^{\circ} = \frac{20}{XX}$.

*October* 25, 1876. D. M., æt. 65. Inward pterygia for many years.

R. E. Vn. $\frac{20}{XL}$; atropinized $\frac{20}{LXX}$; with $+36 \bigcirc +60_{c}\,105^{\circ} = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XL}$; atropinized $\frac{20}{LXX}$; with $+36 \bigcirc +60_{c}\,100^{\circ} = \frac{20}{XX}$.

*November* 2, 1876. J. S. C., æt. 64. Inward pterygia.

R. E. Vn. $\frac{20}{XL}$; atropinized $\frac{20}{C}$; with $+36 \bigcirc +36_{c}\,75^{\circ} = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XL}$; atropinized $\frac{20}{C}$; with $+36 \bigcirc +36_{c}\,80^{\circ} = \frac{20}{XX}$.

*December* 16, 1876. R. T., æt. 66. Inward pterygia (large).

R. E. Vn. $\frac{20}{LXX}$; atropinized $\frac{20}{C}$ (?); with $+24 \bigcirc +48_{c}\,90^{\circ} = \frac{20}{XL}$.

L. E. Vn. $\frac{20}{LXX}$; atropinized $\frac{20}{C}$ (?); with $+24 \bigcirc +48_{c}\,90^{\circ} = \frac{20}{XL}$.

*January* 30, 1877. M. M., æt. 58. Pterygia (inward).

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+48 \bigcirc + 60_{c} 90° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+48 \bigcirc + 60_{c} 90° = \frac{20}{XX}$.

*February* 8, 1877. J. McL., æt. 25. Incipient pterygium either eye.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+36 \bigcirc + 60_{c} 60° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+36 \bigcirc + 60_{c} 90° = \frac{20}{XX}$.

*March* 16, 1877. J. P., æt. 67. Pterygium on each eye, which have been coming for three or four years past. That on the R. E. more developed than that on the left.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{LXX}$; with $+30 = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{LXX}$; with $+40 = \frac{20}{XX}$.

*April* 2, 1877. M. F. S., æt. 48. Well-developed pterygium, L. E.

L. E. Vn. $\frac{20}{XXX}$; atropinized $\frac{20}{XL}$; with $+48_{c} 90° = \frac{20}{XX}$.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+60_{c} 180° = \frac{20}{XX}$.

*May* 10, 1877. D. P. W., æt. 32. When 15 years of age became an apprentice to a printer. From close application his eyes would become very tired, and at times inflamed. After rest and light treatment he could resume work again. Soon, however, he noticed two fleshy growths at the inner angle of each eye. These increased, so that, when at the age of 20, he had them cut off. He continued with his business as printer, and in a short time he could perceive the same growths returning in the eyes. At the end of nine years after the first operation, they were as large as ever, and he had them again removed. This operation left an opaque spot in the cornea immediately over the pupil of the R. E. For the past year he has noticed that it seems to be returning again in the L. E., the only one he can use, as the spot on the R. E. interferes with vision. I, therefore, examined the L. E. only.

L. E. Vn. $\frac{20}{C}$; atropinized $\frac{20}{C}$ (?); with $+12_{c} 90° = \frac{20}{XX}$ (?).

*May* 31, 1877. Mr. S. Pterygium L. E., has been growing some time.

L. E. Vn. $\frac{20}{XL}$; atropinized $\frac{20}{LXX}$; with $-48_{c} 90° = \frac{20}{XX}$ (?).

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XX}$; emmetropic.

*June* 6, 1877. H. B. R., æt. 42. Pterygium; growing for a long time.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{10}{C}$; with $+24 = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{15}{C}$; with $+24 = \frac{20}{XX}$.

### *Inflammation of the Lids.*

Blepharitis—Eczema—Hordeolum.

In relation to the inflammation of the edges of the eyelids being caused by defects of vision, I take the liberty of introducing here, for illustration sake, a paper on this subject, which I published in the *Philadelphia Medical Times*, March 17, 1877, with some additional well-marked cases that have come under my treatment since it was written.

*February* 7, 1876. Mr. F., æt. 19. Has had blepharitis the past two years. The lids are always worse on severe use of the eyes.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+48 = \frac{20}{XX}$.

Hypermetropia $= \frac{1}{48}$.

*February* 25, 1876. Mr. C., æt. 28. Complains that for years he has had trouble with the edges of his eyelids.

L. E., convergent strabismus $1'''$.

L. E. Vn. $\frac{2}{C}$; $+9 = \frac{10}{C}$.

R. E. Vn. $\frac{20}{XL}$; atropinized $\frac{20}{LXX}$; with $+9 = \frac{20}{XX}$.

Since use of the glasses no return of blepharitis.

*February* 27, 1876. Miss H., æt. 15. Blepharitis the past year.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+36 = \frac{20}{XX}$.

Hypermetropia $= \frac{1}{36}$.

*February* 29, 1876. Mr. M., æt. 24. Blepharitis for the past two or three years.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+36 = \frac{20}{XX}$.

Hypermetropia $= \frac{1}{36}$.

*March* 3, 1876. Master J., æt. 16. The past year has been applying his eyes to close and fine work in a machine-shop, and has noticed an inflammation and eruption on the edges of the lids.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+36 = \frac{20}{XX}$.

Hypermetropia $= \frac{1}{36}$.

*March* 7, 1876. Master McC., æt. 10. Edges of the lids inflamed the past six months; always worse on attempting to study.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+42 = \frac{20}{XX}$.

Hypermetropia $= \frac{1}{42}$.

*March* 17, 1876. Miss G., æt. 20. Edges of the lids inflamed for some time. Cannot read nor sew with comfort; pain in the eye and over the brow and in the back of the head.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+40 \bigcirc +60_c\, 90° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+48 \bigcirc +60_c\, 90° = \frac{20}{XX}$.

Refraction, compound hypermetropic astigmatism.

*March* 22, 1876. Master G., æt. 14. Blepharitis for three or four years; lids always worse after reading.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+48 = \frac{20}{XX}$.

Hypermetropia $= \frac{1}{48}$.

*March* 29, 1876. Mr. D., æt. 28. For the past five years edges of the lids have been inflamed; kept pulling the ciliæ out, but no relief.

Vn. $\frac{20}{XXX}$; atropinized $\frac{20}{LXX}$; with $+20 = \frac{20}{XX}$.

Hypermetropia $= \frac{1}{20}$.

*April* 8, 1876. Miss G., æt. 24. Blepharitis.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+48 = \frac{20}{XX}$.

Insufficiency of L. rectus internus, 4°.

*May* 22, 1876. Mr. C., æt. 23. Blepharitis.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+30 = \frac{20}{XX}$.

Refraction, hypermetropia, $\frac{1}{30}$.

*June* 5, 1876. Mr. McL., æt. 26. Blepharitis R. E. the past two years; nothing would cure it.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+48 = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XX}$; emmetropic.

The R. E. recovered soon after the use of the glass, and has remained well ever since.

*June* 19, 1876. Mrs. H., æt. 25. Has had blepharitis since nine or ten years of age; has tried everything without a successful and permanent cure.

Vn. $\frac{20}{XXX}$; atropinized $\frac{20}{LXX}$; with $+30 = \frac{20}{XX}$.

In one week after wearing the glasses and treatment, the lids were almost well, since which time she has had no return of the old inflammation.

*July* 7, 1876. Mr. B., æt. 26. The eyelids have been inflamed for some time.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+42 = \frac{20}{XX}$.

Hypermetropia $= \frac{1}{42}$.

*August* 12, 1876. Mr. W., æt. 28. For three or four years his eyes have troubled him; is a bank clerk, and every day about noon there comes a pain in the head, which remains until he has finished with his duties; edges of the lids much inflamed.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{C}$; with $+16 = \frac{20}{XX}$.

Hypermetropia $= \frac{1}{16}$.

Since using the glasses the lids have recovered their natural look, and there is no return of the daily pain in the head.

*October* 17, 1876. Master L., æt. 14. Blepharitis the past six months.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+42 = \frac{20}{XX}$.

Hypermetropia $= \frac{1}{42}$.

*October* 19, 1876. Mr. A., æt. 31. For several years eyelids have been red and scaly.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XX}$, dim; with $+48_{\circ}90° = \frac{20}{XX}$, sharp.

Refraction, hypermetropic astigmatism, $+48_{\circ}$, axis 90°.

*October* 30, 1876. Master A., æt. 15. Blepharitis five years duration.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+48 = \frac{20}{XX}$.

Hypermetropia $= \frac{1}{48}$.

*November* 7, 1876. Mr. S., æt. 30. Blepharitis one and a half years.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+48 = \frac{20}{XX}$.

Hypermetropia $= \frac{1}{48}$.

*November* 10, 1876. Miss P., æt. 20. For a year past, blepharitis.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+30 = \frac{20}{XX}$.

Hypermetropia = $\frac{1}{40}$.

*November* 15, 1876. Miss W., æt. 19. Blepharitis for over two years.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+36 = \frac{20}{XX}$.

Hypermetropia = $\frac{1}{30}$.

*December* 6, 1876. Mr. J., æt. 27. Has had inflammation of the edges of the eyelid for six years; has undergone much treatment without any benefit.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{LXX}$; with $+24 = \frac{20}{XX}$.

Since the use of the glasses, his eyes have improved steadily, and are now almost well.

*December* 8, 1876. Mr. H., æt. 21. Blepharitis the past year. The lids are better when not using his eyes.

Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+30 = \frac{20}{XX}$.

Hypermetropia = $\frac{1}{40}$.

It will be noticed that all of the above cases were hypermetropic, and in a very great majority of them, of a low degree; only two being astigmatic.

"In my clinic at the Wills Eye Hospital, during the same year, (1876) there were twenty-four cases of blepharitis, all of which could not be examined under the action of atropia, but by the ophthalmoscope were determined five hypermetropes of $\frac{1}{40}$, five of $\frac{1}{30}$, one of $\frac{1}{42}$, three of $\frac{1}{36}$, one of $\frac{1}{24}$, one of $\frac{1}{20}$, one of $\frac{1}{16}$, and one presbyope of $\frac{1}{50}$, four not determined, of which one was only two years old, two of three years, and one four years of age."

*Additional Cases since above were published.*

*January* 16, 1877. Miss M. R., æt. 28. Blepharitis for several years. When a child the edges of the lids were always festering. Had all of the eyelashes drawn out.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+60 \bigcirc +60_{,}\, 90° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+60 \bigcirc +60_{,}\, 90° = \frac{20}{XX}$.

*February* 17, 1877. Mrs. E. H., æt. 30. Blepharitis. When small the eyes were affected from the measles. The eyelashes continually fall out.

R. E. Vn. $\frac{20}{XXX}$; atropinized $\frac{20}{C}$; with $+16 \bigcirc + 60_{c} 90° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XXX}$; atropinized $\frac{20}{C}$; with $+16 \bigcirc + 60_{c} 90° = \frac{20}{XX}$.

*February* 20, 1877. Mr. J. McN., æt. 35. The edges of the eyelids have been inflamed for the past eight years.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{LXX}$; with $+40 = \frac{20}{XX}$.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{LXX}$; with $+48 \bigcirc + 60_{c}$ [illegible] $\frac{20}{XX}$.

*February* 22, 1877. Mr. W. Y., æt. 22. Blepharitis.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+48 = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+48 = \frac{20}{XX}$.

*March* 5, 1877. Mr. E. C. S., æt. 29. Blepharitis and conjunctivitis. Most all his life near-sighted. Has used ordinary concave glasses. His lids have been steadily inflamed for the past three years.

L. E. Vn. $\frac{3}{C}$; with $-8 \bigcirc -30_{c} 105° = \frac{20}{XX}$.

for reading $-16 \bigcirc -30_{c} 105°$.

R. E. Vn. $\frac{2}{C}$; with $-4\frac{1}{2} \bigcirc -30_{c} 60° = \frac{20}{XX}$.

for reading $-6 \bigcirc -30_{c} 60°$.

*March* 12, 1877. Master F. E., æt. 11. Blepharitis.

R. E. Vn. $\frac{20}{XL}$; atropinized $\frac{8}{C}$; with $+5 = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XL}$; atropinized $\frac{8}{C}$; with $+6 = \frac{20}{XX}$.

*May* 2 1877. Mr. C. J., æt. 19. Blepharitis for years.

R. E. Vn. $\frac{20}{LXX}$; atropinized $\frac{20}{XL}$; with $-40 \bigcirc -60_{c} 180° = \frac{20}{XX}$.

L. E. Vn. $\frac{10}{C}$; atropinized $\frac{5}{C}$; with $-16 \bigcirc -48_{c} 180° = \frac{20}{XX}$.

*May* 14, 1877. Master J. G., æt. 15. Blepharitis for five years.

R. E. Vn. $\frac{20}{xx}$; atropinized $\frac{20}{xxx}$; with $+48 = \frac{20}{xx}$.

L. E. Vn. $\frac{20}{xx}$; atropinized $\frac{20}{xxx}$; with $+48 = \frac{20}{xx}$.

In addition to the above I add an interesting case of a gentleman who had been troubled with an eczema of the upper lids for a long time. He came May 9th, 1876, to me for treatment. His vision was found to be—

R. E. Vn. $\frac{18}{c}$; with $-20_{.}\ 180° = \frac{20}{xx}$.

L. E. Vn. $\frac{18}{c}$; with $-20_{.}\ 180° = \frac{20}{xx}$.

Being 53 years of age, there was a presbyopia of $\frac{1}{20}$th found also. I ordered this gentleman to wear the cylinder glasses continually; and I found that the eczema passed off in a few days. I see this case often, and there has never been the least sign of a return of the trouble in the lids.

I would also mention here that in two cases of recurrent styes in young persons, I found high degrees of hypermetropia. And since the correction of the defect in refraction, there has been no return of the hordeola.

In classifying the cases under affections of the conjunctiva we have—

Of *Conjunctivitis*:—

Hypermetropia, 10.

Hypermetropic astigmatism, 2.

Compound hypermetropic astigmatism, 6.

Myopia, 2.

Compound myopic astigmatism, 1.

Mixed astigmatism, 1.

One case in which in the one eye there was myopia, while in the other there was compound myopic astigmatism.

One case, in one eye there was myopic astigmatism, while in the other compound myopic astigmatism.

One case, hypermetropia in one eye and compound hypermetropic astigmatism in the other.

Of *Phlyctenulæ*:—

Hypermetropia, 6.

Of *Pterygium*:—

Hypermetropia, 3.

Hypermetropic astigmatism, 2.

Compound hypermetropic astigmatism, 7.

Myopic astigmatism, 1.

One case, hypermetropia in one eye, and hypermetropic astigmatism in the other.

In all of our text-books on ophthalmology, conjunctivitis is supposed to be caused by sudden changes of temperature, exposure to cold, draught, wet, too great heat, or glare of light, excessive use of the eyes by artificial light, close, crowded, ill-ventilated rooms, acute exanthemata, foreign bodies, injuries and contagion; but nothing is said of ametropia being one of the probable causes.

There is not the least doubt that it may occur from any of the above-mentioned causes, and, as has lately been found, also from the strain in acts of vision, where there is defective refraction. And in all of the above-described cases of conjunctivitis, I have no doubt of the ametropia being the real cause of the simple primary inflammation, which flowed into other and severer forms by the continual strain, as well perhaps increased by the treatment, which might have been too energetic.

There were many other cases of the same affection under my care during the same time, the causes of which could be traced to those ordinarily mentioned, and in which no ametropia was found.

Pterygium, one of the affections of the conjunctiva, is often obscure as to its cause. Now why can it not arise from strain in defects of vision as well as conjunctivitis? It is a well-known fact that "What is one man's meat is another's poison;" and that persons are affected differently by the same cause. It is not always conjunctivitis that issues from ametropia; but, as has been shown by Dr. Roosa[1] and myself,[2] it may cause blepharitis ciliaris. Now why cannot it be at the foundation or origin of pterygium in some cases?

This affection is, with but few exceptions, met with at the inner angle of the eye over the internal rectus muscle; rarely at the outer angle, and seldom upwards or downwards. In all acts of accommodation, particularly at close work, convergence is required, and thus the internal recti muscles are drawn upon and severely taxed, so that when there is a defect in refraction, this tension of the recti with the strain of accommodation in the ciliary muscle, made for the purpose of obtaining good vision, can create a fulness of the vessels in the bulbar conjunctiva over the rectus muscle, which, from the continued strain, become enlarged and congested so as to cause a slight inflammation and induration in the conjunctiva in that locality.

[1] Report of the 5th Int. Ophth. Congress, 1876; and Amer. Journ. of Med. Sciences, Oct. 1876.

[2] Phila. Med. Times, March 17, 1877.

If the defect and strain is only in one eye, then this eye alone will be troubled with the inflammatory action; but, if both are strained in the act of vision, then double induration can take place.

There is no doubt that pterygium may arise from other causes; but I think that ametropia has much to do with it; as is shown in the cases above stated. The occurrence of it in young persons is a proof in my mind of the fact, as well as the return after operation.

In analyzing the cases presented, it will be seen that the pterygium was always at the inner angle. In the first case, it was developed only on the eye in which astigmatism was found; this eye being under the greater strain in acts of vision; in the second case, only in the eye having a marked hypermetropia. In the third case, of a boy only 14 years of age, both eyes suffered under compound hypermetropic astigmatism, and both eyes had an incipient pterygium. Look at the twelfth case.—How marked! A man aged only thirty-two, having had a pterygium removed from each eye when but twenty years old, both of which re-formed and were again operated upon nine years subsequently; and now three years after, again showing signs of return in the eye he uses only for clear vision. On examination of this eye there is a hypermetropic astigmatism of 12 radius at an angle of 90 degrees. The vision of the other eye could not be determined on account of the opacity of the cornea. This defect in the L. E. shows that the eyes have been under a continual strain.

Phlyctenular troubles occur mostly in infants or very small children, so that we do not get the chance to examine the refraction of their eyes; but in the few cases of this disease that I have had in persons old enough to undergo the examination, I have invariably found some defect. It will be seen that they were all hypermetropic. And as the phlyctenular affections are looked at, as from a constitutional origin (scrofulous diathesis, etc.), I do not wish to throw out any idea supposing ametropia to be a cause for this disease, but only to call attention to the fact of ametropia being found in these cases; and whether its presence might not create that congestive condition which would make the eyes the weak point for the cropping out of this recurrent trouble from the diseased system.

In classifying the cases of the affections of the lids, in the additional cases of blepharitis, we have of—

Hypermetropia, 3.

Compound hypermetropic astigmatism, 3.

Compound myopic astigmatism, 2.

In my first report on this disease it will be seen that in twenty-three cases there was not one of a myopic tendency, while in the

eight additional, treated since, there were two having compound myopic astigmatism.

The action on the lids, from strain of the eyes, was so marked in one of these cases that I feel it necessary to relate it, as it explains the cause of his blepharitis.

Case of March 5, 1877. Mr. E. C. S. After wearing his distant glasses for a while, his eyelids became perfectly well; when one day he had considerable writing to do, and having forgotten to take his reading glasses with him to the office, he attended to all the business, writing until quite late with his distant glasses. The next day the blepharitis was as bad, if not worse, than ever. I have particularly cautioned him about doing this foolish act again. His eyes have again resumed their healthy appearance.

"Also in the case of date June 5, 1876, the hypermetropia was, without doubt, the cause of the blepharitis; as the lids of only one eye were affected, and this was the hypermetropic one, while the other was normal, and no defect of refraction could be found."

"The question would naturally arise, 'How can ametropia be a cause of blepharitis?'"

"That ametropia of any kind or form causes in all acts of vision a strain more or less upon the eye, which creates a hyperæmic condition of the neighboring parts, is a well-known fact, as may be seen in many such cases by red and congested conjunctiva and edges of the lids after use at close work or reading. In cases where the strain is so great as to create a continued hyperæmia of the edges of the lids, the extremely fine ducts and external openings of the small sebaceous glands (Zeiss's glands) that are to be found in the canals and follicles of the ciliæ, become closed by pressure, from the swelling of the tissue and vessels surrounding them, and having no outlet for the natural secretions, which are now increased by the hyperæmic condition, a choked status is formed, and inflammation and suppuration take place, as may be noticed in the little pus bead that is found encircling the cilia and extending down the canal to the gland."

"Rest of the eyes, with proper local treatment, removes in time this suppuration and inflammatory action, and apparently the whole disease is cured; but on resuming active use of the eyes, the same condition of hyperæmia returns, with eventually the whole former trouble. But, when the ametropia is corrected, and the strain on the eye removed, there will be no return of the condition of hyperæmia, and a perfect cure of the blepharitis can be made."

I would ask here, "Could the ametropia have been the cause of the styes in the two cases casually mentioned?" Since using their glasses, now over six months, there has been no return of the painful

malady. And would it not be well to examine the state of refraction of the eyes in cases of recurrent styes, as well as in all the affections of the lids and conjunctiva that present themselves?

I have looked over the following recent works on ophthalmology: Stellwag, Wecker, Galezowski, Schweigger, Wells, Graefe und Saemisch, Tetzer-Gruenfeld, von Graefe's Archiv, Zehender's Monatsblätter, Ophthalmic Hospital Reports, Annales d'Oculistique, Journal d'Ophthalmologie, Archives for Ophthalmology and Otology, Donders on Accommodation and Refraction, and Nagel's Jahresbericht, without finding any mention of this connection of ametropia to any of the above-mentioned forms of diseases of the eye.

*Note.*—Since preparing and reading the above paper, a few cases have come to my notice, which I take the liberty of adding:—

*June* 18, 1877. Mr. H. G., æt. 28. Eyes inflamed for two years.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+36 \bigcirc +60_{c} 90° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XXX}$; atropinized $\frac{20}{LXX}$; with $+36 \bigcirc +60_{c} 75° = \frac{20}{XX}$.

*June* 19, 1877. Mary K., æt. 14. Papillary granulations all over the conjunctiva of the lids and bulb for the past three years.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$ (?); with $+60_{c} 90° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$ (?); with $+60_{c} 90° = \frac{20}{XX}$.

*June* 20, 1877. J. M. J., æt. 16. Student. Has been having small styes on the lids for the past five or six years.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+48_{c} 90° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+60_{c} 90° = \frac{20}{XX}$.

*June* 23, 1877. Sarah McN., æt. 27. Phlyctenular conjunctivitis. Reports that she has had such inflammation off and on for many years.

Vn. either eye $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+24 = \frac{20}{XX}$.

*June* 30, 1877. Wm. K., æt. 24. Phlyctenular conjunctivitis.

Vn. either eye $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+30 = \frac{20}{XX}$.

*July* 6, 1877. Miss F. S., æt. 18. Has always had weak eyes, and follicular conjunctivitis for the past year.

R. E. Vn. $\frac{20}{XXX}$; atropinized $\frac{20}{LXX}$; with $+36 = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XXX}$; atropinized $\frac{20}{C}$; with $+24 = \frac{20}{XX}$.

*July* 18, 1877. Mr. S. G. L., æt. 38. A small pinguecula on the R. E. just back of the inner edge of the cornea, with quite a large vessel running along the conjunctiva to it. At times this becomes much inflamed. More particularly so after the use of the eyes at hard study for a time.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{LXX}$; with $+60 \bigcirc +48_{.}\, 90° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XL}$; with $+60 \bigcirc +60_{.}\, 90° = \frac{20}{XX}$.

*July* 18, 1877. Mr. W. S. H., æt. 22. For the past two years the eyelids have been inflamed. They are much worse after reading or writing for a time. When a boy, was frequently troubled with styes, but has had none for the past twelve months.

R. E. Vn. $\frac{20}{XXX}$; atropinized $\frac{10}{C}$; with $+20 \bigcirc +36_{.}\, 105° = \frac{20}{XX}$.

L. E. Vn. $\frac{20}{XXX}$; atropinized $\frac{8}{C}$; with $+20 \bigcirc +42_{.}\, 75° = \frac{20}{XX}$.

The following case is furnished me by Dr. Thos. H. Fenton: "J. H., æt. 20. Presented himself suffering from a large stye on the left upper lid; with the history of recurrent styes on this eye, as well as congestion and pain whenever he exercised his eyes steadily. The edges of the lids of the R. E. were slightly congested, but gave no annoyance. After the stye was cured his vision was found to be:—

L. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{L}$; with $+36 = \frac{20}{XX}$.

R. E. Vn. $\frac{20}{XX}$; atropinized $\frac{20}{XXX}$; with $+48 = \frac{20}{XX}$.

After wearing the glasses for a month all traces of congestion had disappeared. There is no more pain, and he says that he has never known so much comfort in seeing."